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# Phylogenetic revision of the *Taenogera* Kröber genus-group (Diptera: Therevidae), with descriptions of two new genera

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**Abstract** The phylogenetic relationships of the *Taenogera* genus-group, consisting of nine genera, are examined using cladistic methods. Twenty-one species representing nine genera and one outgroup were compared in a cladistic analysis across 99 states in 44 characters. The genus *Taenogera* Kröber is revised to contain only *T. longa* (Schiner), *T. nitida* (Macquart) and *T. notatithorax* Mann. Two new genera are described and figured: *Actenomeros* gen. n., with two species, *A. corniculaticaudus* sp. n. and *A. onyx* sp. n.; and *Taenogerella* gen. n., with four species, *Ta. elizabethae* sp. n., *Ta. platina* sp. n., *Ta. schlingeri* sp. n. and *Ta. nigrapicalis* (Mann) comb. n. Phylogenetic analysis also supports the removal of *Nanexila gracilis* (Mann) comb. n. from *Taenogera*.

**Key words** *Actenomeros*, cladistics, *Ectinorhynchus*, *Eupsilocephala*, *Johnmannia*, *Nanexila*, *Neodialineura*, phylogenetics, *Squamopygia*, *Taenogerella*, Therevidae.

## INTRODUCTION

The Therevidae are a cosmopolitan group of asiloid Diptera closely related to the Scenopinidae, Apioceridae and Asilidae (Woodley 1989). Therevids are found in a variety of habitats from deserts to rainforests to beach dunes, but with greatest diversity in semiarid regions. The adults are nectar feeders, while the larvae are voracious, fossorial predators of other soil arthropods, often found in sandy, friable soils (Irwin & Lyneborg 1981).

The internal hierarchy of the Therevidae is presently unclear. Lyneborg (1976) and Irwin and Lyneborg (1981) erected a subfamilial classification based on the Nearctic fauna by dividing the family into two subfamilies: Phycinae and Therevinae. Both Irwin and Lyneborg (1981) and Yeates (1992) indicate that this classification is not definitive and will need revision once the world therevid fauna is better known in a phylogenetic context.

The Australasian Therevidae are composed exclusively of three endemic genus-groups: the *Anabarhynchus* Macquart genus-group, the *Agapophytus* Guérin-Méneville genus-group, and the *Taenogera* Kröber genus-group (unpublished data). The *Anabarhynchus* genus-group, containing the genera *Anabarhynchus*, *Platycarenum* Kröber, *Irwiniella* Lyneborg and *Megathereva* Lyneborg, clearly belong to the Therevinae and possess characters such as two spermathecae, multiple vestiture types on the femora, parameral sheath separate from gonocoxal apodeme, female acanthophorites present and sclerotised bridge between female abdominal tergites 8 and 9 + 10. In contrast, the *Taenogera* and *Agapophytus* genus-groups do not fit the traditional classification, rather the two groups form an intermediate grouping possessing characters found in both subfamilies. The *Taenogera* and *Agapophytus* genus-groups possess female therevine characters such as acanthophorites on cerci, spermathecal sac present, and sclerotised bridge between abdominal tergites 8 and 9 + 10. Both groups also possess male and female phycine characters such as three spermathecae, simple femoral vestiture and sclerotised bridge between dorsal apodeme of the parameral sheath and the gonocoxal apodeme (SLW, unpubl. data, 1999).

The *Taenogera* genus-group is the probable sister group to the *Agapophytus* genus-group (Winterton *et al*. in press). It is composed of nine genera: *Taenogera*, *Nanexila* Winterton and Irwin, *Neodialineura* Mann, *Ectinorhynchus* Macquart, *Johnmannia* Irwin and Lyneborg, *Eupsilocephala* Kröber, *Squamopygia* Kröber, *Taenogerella* gen. n. and *Actenomeros* gen. n. The *Taenogera* genus-group can be distinguished from the *Agapophytus* genus-group by characters such as wing cell $m_3$ open, velutum patches on fore and hind femora absent (plesiomorphic), single seta present antero-ventrally on apex of hind femur (except *Neodialineura*), velutum absent from ventral surface of gonocoxites surface (plesiomorphic) and larva with anterior maxillary palp well developed and maxillary beard (*sensu* English 1950) present.

Kröber (1912b) erected *Taenogera* to accommodate *T. longa* Kröber. Mann (1928) later transferred *Anabarhynchus nitidus* Macquart, *Ectinorhynchus superbus* Schiner and *Xylophagus latistria* Walker to *Taenogera*, and found *T. longa* to be a junior synonym of *A. nitidus*. Irwin and Lyneborg (1989) subsequently transferred *T. superbus* and

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*T. latistria* to *Ectinorhynchus* and moved *Anabarhynchus longus* Schiner to *Taenogera*.

Mann (1928) described *T. nigrapicalis* from a single female. Males of this species have subsequently been collected, and examination of the male genitalia shows that they are clearly different from those of *Taenogera sensu stricto*. A new genus, *Taenogerella* (Fig. 1), is here erected for this species plus three new species. *Taenogera gracilis* was also described in the same paper from a single female by Mann (1928) and is clearly separable from the *Taenogera s.s.* on male genitalic characters. This species is here transferred to *Nanexila* Winterton and Irwin. Another new genus, *Actenomeros*, is erected for *A. corniculaticaudus* sp. n. and *A. onyx* sp. n.

Paramonov (1950) revised *Eupsilocephala* with two species, and described its monotypic sister genus *Johnmannia*. *Squamopygia* was erected by Kröber (1928) containing two species, *S. fascipennis* Kröber and *S. ornata* Kröber. Irwin and Lyneborg (1989) recognised that *Squamopygia* was paraphyletic and placed *S. fascipennis* as *incertae sedis* within the Therevidae. The concept of *Squamopygia* based on the type species, *S. ornata*, clearly places the genus within the *Taenogera* genus-group. *Squamopygia fascipennis* is placed within the *Agapophytus* genus group by the presence of femoral and gonocoxite velutum patches. *Ectinorhynchus* is a well-defined genus with 15 described and numerous undescribed species from Australia and New Zealand. Although *Squamopygia* and *Ectinorhynchus* are in need of revision, it is beyond the scope of this study.

A phylogenetic analysis was undertaken on the *Taenogera* genus-group, including all species of *Actenomeros* gen. n., *Squamopygia*, *Taenogera*, *Neodialineura*, *Johnmannia* and *Taenogerella* gen. n., and exemplars from species-groups of *Nanexila*, *Eupsilocephala* and *Ectinorhynchus*. The phylogenetic relationships of the genus-group based on the results of the analysis are presented. *Taenogera* is redefined in light of the analysis.

## MATERIALS AND METHODS

Genitalia were macerated to remove soft tissue in 10% KOH at 40–50°C for 1h, then rinsed in distilled water and dissected in 80% ethanol. Female reproductive organs were stained with a saturated solution of Chlorazol Black in 40% ethanol. Preparations were then placed into glycerine gel and figures drawn using a camera lucida mounted on a Zeiss Stemi SV-6 stereomicroscope (Germany). Internal membranous structures of the female reproductive system were figured, while still in ethanol as they collapse and distort when placed into glycerine or glycerine gel. Genitalia preparations are stored in glycerine and/or glycerine gel in a genitalia vial mounted on the pin underneath the specimen. Where possible, specimens examined were given a unique 'MEI' number (yellow label on specimen pin). These numbers represent entries in a therevid database ('MANDALA') and are quoted in parentheses in the material-examined list for future reference for specimen identification and location. Terminology for body vestiture and genitalia follows originally Irwin and Lyneborg (1981), and is modified after Winterton *et al*. (1999). New names are attributed to Winterton and Irwin. When in combination with species epithets, the names *Taenogera* and *Taenogerella* gen. n. are abbreviated as *T.* and *Ta.*, respectively, in the text. All types were examined.

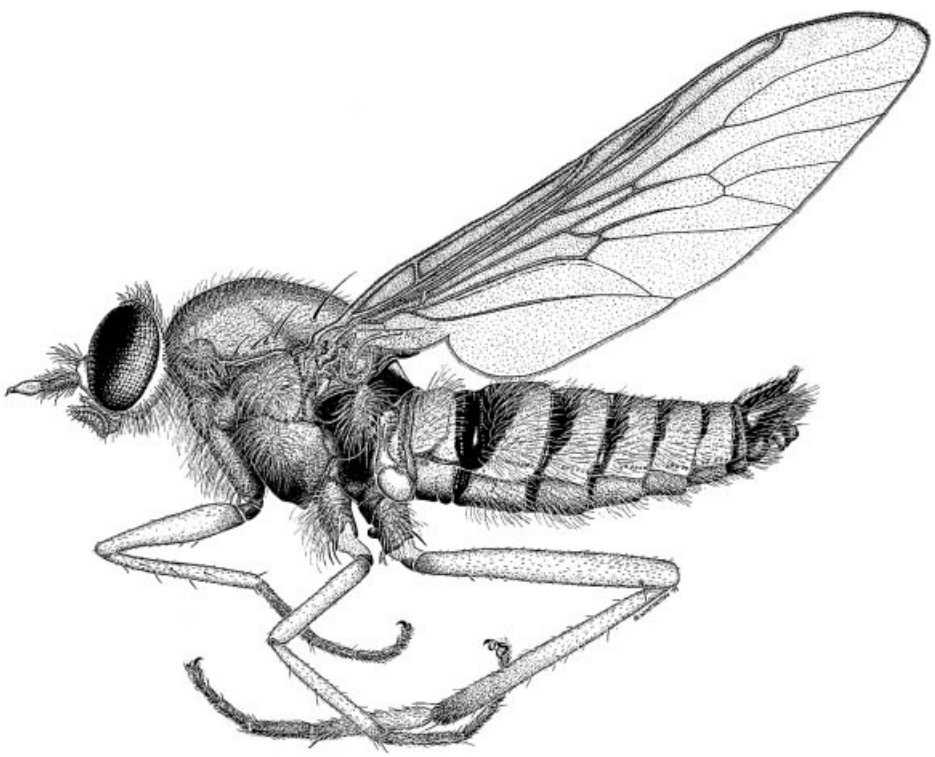


***Fig. 1.*** *Taenogerella platina* sp. n. adult male habitus. Body length about 10 mm.

***Table 1*** Character matrix of *Taenogera* genus-group

| | 10 | 20 | 30 | 40 |
|---|---|---|---|---|
| *Agapophytus albobasalis* | 1000000001 | 0240000000 | 0000000001 | 1102100000 0101 |
| *Neodialineura striatithorax* | 1000011110 | 0200100001 | 1000000101 | 0000000000 0000 |
| *Actenomeros corniculaticaudus* | 1000111111 | 0130000101 | 1013000101 | 0100100010 0120 |
| *Ac. onyx* | 1000111111 | 0130000101 | 1013000101 | 0100100010 0120 |
| *Nanexila atricostalis* | 2000111111 | 0230100001 | 1010000100 | 0200000000 0020 |
| *Na. danielsi* | 1000111111 | 0230100101 | 1010020100 | 0100010000 1000 |
| *Na. gracilis* | 2010111111 | 0230100101 | 1010020100 | 0100110000 1010 |
| *Na. manni* | 2000111111 | 0230100001 | 1010000100 | 0100000000 0000 |
| *Taenogera longa* | 0111111111 | 2011100111 | 1012110110 | 1102100100 0110 |
| *T. nitida* | 0111111111 | 2010000101 | 1012100110 | 1102100000 0110 |
| *T. notatithorax* | 0111111111 | 2011100111 | 1012110110 | 1102100100 0110 |
| *Taenogerella elizabethae* | 2000111111 | 0200010001 | 1111111101 | 0201101001 1000 |
| *Ta. nigrapicalis* | 1000111111 | 0100000001 | 1113111101 | 0201101001 1010 |
| *Ta. platina* | 2000111111 | 0100010001 | 1111101101 | 0201101101 1010 |
| *Ta. schlingeri* | 1000111111 | 0100000001 | 1111111101 | 0201101001 1010 |
| *Ectinorhynchus variabilis* | 1010011012 | 1220020001 | 1113021101 | 11?1100011 0110 |
| *Ec. pyrrhotelus* | 1010111012 | 1220020001 | 1113001101 | 1111100101 0110 |
| *Ec. phyciformis* | 1010011002 | 1220020011 | 1113021101 | 1111100001 0110 |
| *Johnmannia tasmanica* | 1011011010 | 2010001111 | 1010000111 | 1101100100 1121 |
| *Eupsilocephala kroeberi* | 1011111111 | 2010001111 | 1010000111 | 1101100100 1121 |
| *Squamopygia ornata* | 1000010012 | 1220000001 | 1113000111 | 1100100100 0110 |
| *Squamopygia sp.* 1 | 1000010012 | 1220000001 | 1113000111 | 1100100100 0110 |

The following abbreviations are used for collections from which specimens were examined: AM, Australian Museum, Sydney; ANIC, Australian National Insect Collection, CSIRO Entomology, Canberra; ASCT, Agricultural Scientific Collections Trust, New South Wales Agriculture, Orange; NHM, Natural History Museum, London; BPBM, Helms Collection, Bernice P. Bishop Museum, Honolulu; CASC, California Academy of Sciences, San Francisco; FSAC, Florida State Arthropod Collection, Gainsville; GDCB, Greg Daniels Collection, University of Queensland, Brisbane; IRWC, Mike Irwin Collection, University of Illinois, Champaign; MNHN, Muséum National d'Histoire Naturelle, Paris; NMW, Naturhistorisches Museum Wien, Vienna; QM, Queensland Museum, Brisbane; SAM, South Australian Museum, Adelaide; UCDC, Bohart Museum of Entomology, University of California, Davis; UQIC, University of Queensland Insect Collection, Brisbane; WAM, Western Australian Museum, Perth.

The following abbreviations are used for scutal chaetotaxy: dc, dorsocentral setae; np, notopleural setae; pa, postalar setae; sa, supra-alar setae; sc, scutellar setae.

## CLADISTIC ANALYSIS OF THE *TAENOGERA* GENUS-GROUP

### Data analysis

Character polarity was determined using outgroup comparison (Maddison *et al*. 1984; Nixon & Carpenter 1993). Those characters with more than one derived state were coded as unordered. Cladistic analyses were performed using PAUP version 3.1.1 (Swofford 1993) using the 'branch and bound' tree-finding algorithm, and repeated using Hennig86 version 1.5 (Farris 1988). Figure 3 and the matrix presented in Table 1 were prepared in Maclade version 3.01 (Maddison & Maddison 1992). A full list of exemplar taxa used in the analysis is also given in Table 1. Figure 2 was prepared using Clados version 1.2 (Nixon 1992) with delayed transformation (DELTRAN) optimisation. Branch support (Fig. 3) was calculated using Autodecay version 3 (Eriksson & Wikstrom 1996) and PAUP version 3.1.1.

### Outgroup selection

*Agapophytus albobasalis* Mann, a member of the *Agapophytus* genus-group was chosen as the outgroup to root the analysis due to its probable close phylogenetic relationship to the *Taenogera* genus-group. The *Taenogera* genus-group is proposed here as an informal grouping rather than raised to tribal status, pending complete phylogenetic analysis of the Therevidae.

### Descriptions of characters and states

We used 44 characters comprising 99 states in the analysis. All characters were coded as an unordered. Most are binary, but characters 1, 12, 16, 26, 32, 34 and 43 were coded as multistate characters each with three states, while characters 13 and 24 were coded with four states.

1 *Male frons:* 0, wide (Fig. 36); 1, narrowed dorsally; 2, contiguous (Fig. 37).
2 *Male frons with fine pale setae:* 0, absent; 1, present (Fig. 36).
3 *Female frons with dark setae:* 0, present; 1, absent.
4 *Eye shape along margin:* 0, smooth; 1, bulbous.
5 *Scape length:* 0, long; 1, short.
6 *Setae on scape:* 0, along all surfaces; 1, absent along medial surface.

7 *Scape width:* 0, narrower or as wide as pedicel; 1, wider than pedicel.
8 *Flagellum shape:* 0, long narrow; 1, broad, conical or onion shaped.
9 *Setae on flagellum:* 0, present along most of length; 1, present at base only.
10 *Antennal tubercle:* 0, present; 1, absent; 2, tubercle above antennae, flattened.
11 *Number of rows of postocular setae in female:* 0, 1–3 poorly defined rows; 1, one; 2, more than three rows.
12 *Number of rows of postocular setae in male:* 0, more than two; 1, two; 2, one.
13 *Occiput colour pattern:* 0, dark brown; 1, silver or gold velutum; 2, black dorsally, silver velutum medially; 3, uniform grey.
14 *Scutum glabrous with gold pruinescent patches:* 0, absent; 1, present.
15 *Scutellum colour:* 0, dark; 1, pale.
16 *Scutum pattern:* 0, without stripes; 1, broad, grey velutum stripe; 2, two gold velutum stripes.
17 *Body colouration:* 0, pale yellow or black, not metallic; 1, metallic blue.
18 *Number of supra-alar setae:* 0, one; 1, more than one.
19 *Anepisternum:* 0, covered with pruinescence; 1, glabrous.
20 *Wing cell $m_3$:* 0, closed; 1, open.
21 *Fore and hind femora with elongate velutum patches along ventral surfaces:* 0, present; 1, absent.
22 *Hind femur length:* 0, approximately equal to other femora; 1, much longer than other femora.
23 *Hind femur with apical seta:* 0, absent; 1, present.
24 *Male abdomen with silver velutum:* 0, absent; 1, restricted to hind margins of tergites; 2, present as lateral triangular patches on tergites; 3, extensive.
25 *Female abdomen with velutum:* 0, absent; 1, present.
26 *Abdomen colour:* 0, uniformly dark; 1, pale with black apex; 2, uniformly pale.
27 *Male genitalia with large atrium:* 0, absent (Fig. 25); 1, present (Figs 44, 67).
28 *Gonocoxites with velutum patch:* 0, present; 1, absent.
29 *Gonocoxites with ventral ridge:* 0, absent; 1, present (Fig. 18).
30 *Male abdominal tergite 8:* 0, not emarginate (Fig. 11); 1, emarginate (Fig. 59).
31 *Male abdominal tergite 8 with spiracular pore:* 0, absent; 1, present (Fig. 20).
32 *Outer gonocoxal process:* 0, absent; 1, present (Fig. 18); 2, longer than inner gonocoxal process (Fig. 52).
33 *Inner gonocoxal process:* 0, not spatulate; 1, apically spatulate.
34 *Distiphallus:* 0, narrow; 1, broad but tapered apically (Fig. 65); 2, broad, parallel sided (Fig. 21).
35 *Distiphallus with apical spines:* 0, absent; 1, present (Fig. 21).
36 *Distance between lateral ejaculatory apodemes:* 0, equal or subequal to base of distiphallus (Figs 6,65); 1, much wider than base of distiphallus.
37 *Gonostylus:* 0, straight (Fig. 13); 1, directed upward distally (Fig. 62).
38 *Gonostylus with dorsal process:* 0, absent; 1, present at three-quarters of length (Figs 25,30).
39 *Inner gonocoxal process:* 0, present; 1, reduced (Fig. 6).
40 *Hypandrium:* 0, separate from gonocoxite (Fig. 6); 1, fused to gonocoxite (Fig. 60).
41 *Distiphallus:* 0, straight, 1, directed ventrally.
42 *Lobes of parameral sheath:* 0, fused along ventral surface; 1, separate ventrally.
43 *Spermathecal sac type:* 0, simple, spermathecal ducts basal (Fig. 41); 1, trilobate, spermathecal ducts basal (Figs 38–40); 2, trilobate, spermathecal ducts paired.
44 *Spermathecal sac(s) with additional lobe(s):* 0, present; 1, absent.

## DISCUSSION

Analysis of the data matrix in Table 1 using PAUP and Hennig86 produced two most parsimonious cladograms of length 106 steps (consistency index [CI] = 0.55, retention index [RI] = 0.78). One of the two most parsimonious

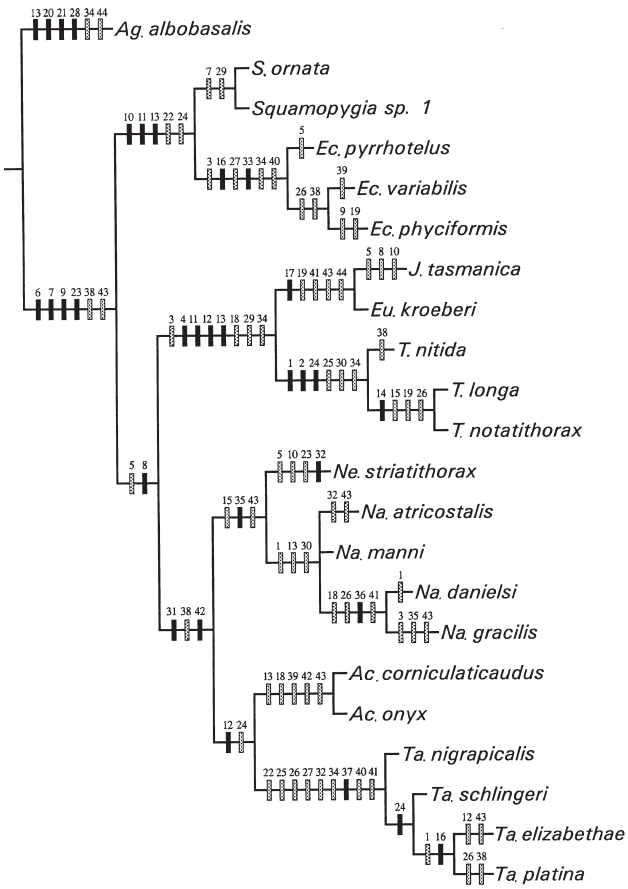



***Fig. 2.*** One of the two most parsimonious cladograms depicting the phylogenetic relationships of the *Taenogera* genus-group. This cladogram is identical to the strict (Nelson) consensus cladogram. Character states are represented on individual nodes with character number presented above each hash. Black hashes-forward changes; grey hashes-homoplasious changes. Abbreviations: Ne, *Neodialineura*; A, *Actenomeros*; T, *Taenogera*; Ta, *Taenogerella*; Na, *Nanexila*.

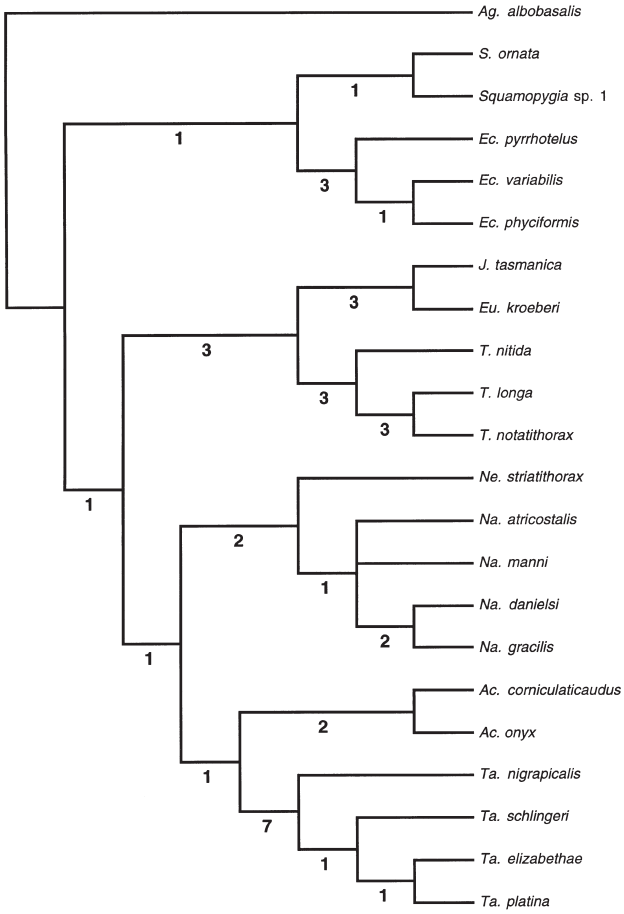



***Fig. 3.*** Consensus cladogram of the two most parsimonious cladograms. Branch support for individual nodes is presented beneath each node.

cladograms is the same as the strict consensus cladogram and is presented in Fig. 2 with character state changes plotted. Both most parsimonious cladograms differ only in the internal arrangement of two species of *Nanexila*.

Consistency index is interpreted as a measure of homoplasy. Sanderson and Donoghue (1989) found that the consistency index is negatively correlated with the number of taxa included in the analysis. The level of homoplasy found in this analysis is slightly lower than other studies including this number of taxa (Sanderson & Donoghue 1989). The relatively high retention index indicates that a high proportion of the synapomorphies are present as homologies on the cladogram.

Characters defining the *Taenogera* genus-group in this analysis include: setae absent along the medial surface of the scape (character 6) and along most of flagellum length (character 9) (reversed in *Ec. phyciformis*), scape wider than pedicel (character 7) (reversed in *Squamopygia*) and hind femur with apical seta (character 23) (absent in *Neodialineura*).

The sister pairing of *Ectinorhynchus* and *Squamopygia* comprises the most basal grouping of the *Taenogera* genus-group. Synapomorphies for both genera include: flattened tubercle immediately above antennae (character 10), single row of postocular setae in female (character 11), and a distinctive occiput colouration (character 13). *Ectinorhynchus* is distributed throughout Australia and New Zealand, while *S. ornata* is recorded from North Queensland and *Squamopygia* sp. 1 has been collected from Papua New Guinea. *Taenogera* and *Johnmannia* + *Eupsilocephala* form a discreet clade based on the following synapomorphies: eye margin bulbous (character 4), numerous rows of postocular setae in the male and female (characters 11, 12) and occiput mostly covered with silver or gold velutum (character 13). Individuals in all genera are typically large (body length > 10 mm) with metallic or glossy black colouration.

Despite superficial resemblance of *N. gracilis* to *Taenogera*, cladistic analysis clearly places this species in *Nanexila*. Scoring *N. gracilis* in the character matrix for *Nanexila* (see phylogenetic analysis presented in Winterton *et al.* [1999]) and running the analysis in PAUP gave two cladograms (length 258 steps) with *N. gracilis* placed within the *N. palassa* species-group. The highly autapomorphic and monotypic genus *Neodialineura* is placed in this analysis as the sister genus to *Nanexila*.

*Actenomeros* gen. n. and *Taenogerella* gen. n. are placed as sister genera based on the presence of two rows of postocular setae in the male (character 12). *Actenomeros* gen. n. is defined by the reduction of the inner gonocoxal process and a horn-shaped outer gonocoxal process. The phylogenetic analysis supports the placement of *Ta. nigrapicalis* in *Taenogerella* gen. n. *Taenogerella nigrapicalis* shares with other members of *Taenogerella* gen. n. the following combination of characters: apex of gonostylus directed upwards (character 37); large atrium between gonocoxites of male (character 27); and hypandrium totally fused with gonocoxites (character 40) (both characters also in *Ectinorhynchus*).

To test for the robustness of the monophyly of the clades, branch support was used. Branch support is defined as the extra cladogram length required for a branch to be lost in the strict consensus of near-most parsimonious cladograms (Bremer 1994), and is reported as a single unit for each additional step the length of the most parsimonious cladograms increase by, in which the branch is not lost. The higher the number, the more support for that particular branch on the most parsimonious cladogram. Branch support values are presented beneath unambiguous nodes on the consensus cladogram in Fig. 3. A polytomy on the consensus cladogram, indicating that there is at least one other equally most parsimonious cladogram with a different arrangement for that node, has a branch support value of zero and is collapsed. The monophyly of all genera except *Nanexila* and *Squamopygia* is relatively well supported with relatively high branch supports for *Ectinorhynchus* (3), *Taenogera* (3) and *Taenogerella* gen. n. (7). The basal relationships between all the genera are not well supported (branch supports = 1), although the monophyly of the clade *Johnmannia* + *Eupsilocephala* + *Taenogera* is well supported throughout (branch supports = 3). The monophyly of *Nanexila* is relatively poorly supported (branch support = 1), and the species level relationships of *Nanexila* based on the exemplars used in this analysis are not fully resolved, indicated by a polytomy at the base of the clade.

It is clear that the composition of the *Taenogera* genus-group, based on this preliminary morphological analysis, is largely centred around plesiomorphic characters. Further analysis in a wider phylogenetic context is required using a wider range of characters from larval, pupal and molecular data sets to better elucidate the monophyly of the group.

In light of recent revisions (Lyneborg 1992; Winterton *et al*. 1999) since the last checklist on Australasian Therevidae by Irwin and Lyneborg (1989), and changes made in this study, a revised checklist of the *Taenogera* genus-group is given in Appendix 1.

## TAXONOMY OF THE *TAENOGERA* GENUS-GROUP

### Key to genera and species

1 Scape elongate, much wider than pedicel; hind femur without apical seta, abdominal tergite 2 with a patch of modified setae in both sexes; outer gonocoxal apodemes absent; dorsal apodeme of parameral sheath reduced ..... .....*Neodialineura striatithorax* Mann

– Scape short or elongate, slightly wider than pedicel; hind femur with apical seta present on anteroventral surface, abdominal tergite 2 rarely present, occasionally in female only; outer gonocoxal apodemes present; dorsal apodeme of parameral sheath well developed.....2

2(1) Scape often elongate, narrow; frons with largely flattened tubercle immediately above antennae; occiput with matte black or brown velutum, medial occipital sclerite with silver velutum; female usually with single row of postocular setae; male abdomen often covered with extensive silver velutum .....3

– Scape rarely elongate, if so then covered in enlarged setae; frons shape otherwise, antennae tubercle, if present, then rounded; occiput not as above; female with more than one row of postocular setae; male abdomen rarely covered with extensive silver velutum.....4

3(2) Scutum often glossy black with two gold or silver stripes along dorsocentral line; male genitalia with medial atrium present; inner gonocoxal process apically spatulate.....*Ectinorhynchus* Macquart

– Scutum brown pruinescent, dorsocentral stripes faint; male genitalia without medial atrium; inner gonocoxal process apically acuminate ..... .....*Squamopygia* Kröber

4(2) Occiput convex, colouration black with silver-white or gold velutum; multiple indistinct rows of postocular setae; distiphallus broad, barrel-shaped (Fig. 21); large species .....5

– Male frons narrowed or contiguous (Fig. 37), frons width sexually dimorphic, much wider in female; occiput concave, colouration otherwise; usually a single row of postocular setae in male, rarely two rows; distiphallus tapered, narrowed apically (Fig. 15); small to medium size species .....9

5(4) Male frons much wider than ocellar tubercle (Fig. 36), only slightly narrower than female frons; abdomen elongate; body colouration glossy ..... .....*Taenogera* Kröber 7

– Male frons slightly wider than ocellar tubercle, frons clearly sexually dimorphic; abdomen shape conical; body colouration metallic blue or green.....6

6(5) Scape elongate; two scutellar setae; wing with black infuscation distally .*Johnmannia* Irwin and Lyneborg

– Scape short; four scutellar setae; wing with orange infuscation .....*Eupsilocephala* Kröber

7(5) Scutum without gold velutum patches; anepisternum with fine pruinescence; scutellum dark, with three to four pairs of bristles; abdomen completely dark brown-black; femora black-brown ..... .....*Taenogera nitida* (Macquart)

– Scutum with gold velutum patches; anepisternum glabrous; scutellum mostly pale, with single pair of bristles; abdominal segments 2–3 orange or red, the rest black; femora pale .....8

8(7) Coxae yellow; upper section of katepisternum with patch of gold velutum; abdominal segments 2–3 bright orange.....*Taenogera notatithorax* Mann

– Coxae black with silver velutum; katepisternum entirely glabrous; abdominal segments 2–3 dark red .....*Taenogera longa* (Schiner)

9(4) Male frons with dark setae, particularly around bases on antennae; gonocoxites with outer gonocoxal processes enlarged, resulting in medial atrium; hypandrium totally fused to gonocoxites, barely evident; gonostyli directed upward apically (Fig. 46) .....*Taenogerella* gen. n. 10

– Male frons with few dark setae, if present then very short and sparsely distributed over frons; gonocoxites with outer gonocoxal processes not forming atrium; hypandrium fused to gonocoxites or separate, always clearly evident; gonostyli not upward directed apically (Figs 7,13).....13

10(9) Abdomen entirely black…*Taenogerella platina* sp. n.

– Abdomen with several segments orange to brown..... .....11

11(10) Costal margin of wing infuscate; scutum with diffuse grey-silver velutum, 0–2 dorsocentral bristles; hind leg dark; slender species from eastern states (Fig. 74) .....*Taenogerella elizabethae* sp. n.

– Costal margin of wing not infuscate; scutum grey or black, with or without stripes, more than two dorsocentral bristles; legs pale; robust species from southern Australia (Figs 74, 75).....12

12(11) Male with abdominal velutum restricted to posterior margin of tergites; female abdomen entirely pale or with diffuse darkening..... .....*Taenogerella schlingeri* sp. n.

– Male with abdominal velutum entirely covering tergites; female with segments 6–8 black..... .....*Taenogerella nigrapicalis* (Mann), comb. n.

13(9) Male postocular ridge with two or more rows of setae; inner gonocoxal processes greatly reduced or absent (Fig. 6); outer gonocoxal process of gonocoxites greatly enlarged, hornlike ..... .....*Actenomeros* gen n. 14

– Male postocular ridge with one row of setae (except *Na. furcata* Winterton and Irwin); inner gonocoxal processes present; outer gonocoxal process not greatly enlarged .....*Nanexila* Winterton and Irwin

14(13) Male gonostylus with two narrow, ventrally directed processes, one basal and the other distal (Fig. 13)..... .....*Actenomeros corniculaticaudus* sp. n.

– Male gonostylus with single, ventrally directed process near apex (Fig. 7)..... .....*Actenomeros onyx* sp. n.

### *Actenomeros* Winterton and Irwin, gen. n.

**Type species.** *Actenomeros corniculaticaudus* sp. n.

**Diagnosis.** Male frons narrow; two to three poorly defined rows of postocular setae; one pair of scutellar bristles; male with extensive abdominal velutum; outer gonocoxal process long, very narrow, upward directed apically; inner gonocoxal process greatly reduced; distiphallus narrow, straight.

**Description.** Head: frons grey pruinescent, large setae absent, frons width sexually dimorphic, narrower in male; occiput concave, grey pruinescent; postocular ridge with two to three poorly defined rows of black setae; gena grey pruinescent, long pale setae; palp pale orange; scape pale orange, shorter than flagellum, numerous dark setae; pedicel much shorter than scape, band of small setae; flagellum brown pruinescent, setae absent, style dark.

Thorax: scutum and scutellum grey pruinescent, numerous fine dark setae scattered over surface; pleuron and coxae grey, covered with thin silver-grey velutum, fine, pale setae sparsely scattered over proepisternum, proepimeron, anepisternum, katepisternum, pteropleural callus and coxae; legs pale yellow, tarsi darkened distally; haltere brown; wing smoky infuscate, venation dark. Scutal chaetotaxy: np, 4; sa, 2; pa, 1; dc, 2; sc, 1.

Abdomen: abdomen black, male with extensive silver velutum on segments 1–6, reduced in female to posterior margins of tergites 2–6; genitalia brown.

Male genitalia (Figs 4–15): epandrium quadrangular, elongate; posterior margin of tergite 8 medially emarginate, several posteriorly directed setae on postero-lateral corners; hypandrium triangular, glabrous, separate from gonocoxites; gonocoxite with scattered setae over outer surface; gonocoxal apodeme reduced; outer gonocoxal process narrowed, upward directed, apically ending in a point; inner gonocoxal process greatly reduced, fused to gonocoxite; gonostylus as long as outer gonocoxal process, ventral and medially directed setae, apex with small dorsal and larger ventral process; distiphallus narrow, straight, dorsal apodeme 'T' shaped, lateral ejaculatory apodeme relatively small, narrow.

Female genitalia: six A1 setae (acanthophorites); eight A2 setae; tergite 8 with narrow process on anterior margin; furca sclerotised in a narrow ring, spermathecal sac shape trilobate, spermathecal duct arrangement paired, one spermathecal duct joining to each spermathecal sac duct.

**Comments.** Two species are described here: *A. corniculaticaudus* sp. n. and *A onyx* sp. n. This genus superficially resembles *Nanexila* but is differentiated by two to three rows of postocular setae and male genitalic features such as a reduced inner gonocoxal process and a large horn-shaped outer gonocoxal process. The spermathecal sac of *A. corniculaticaudus* sp. n. is very similar in shape to that of *Na. paradoxa* Winterton and Irwin.

**Etymology.** From the Greek: *Aktenos* – poor; and *meros* – part, referring to the greatly reduced inner gonocoxal process of the male genitalia. Gender is male.

### *Actenomeros onyx* Winterton and Irwin, sp. n. (Figs 4–9,73)

**Types. New South Wales:** holotype male, Mt Canobolas, 29.x.1957, E.F. Riek (MEI 028132) (ANIC). Condition: good. Paratypes: one female, Mt. Vincent nr Running Stream, 20.xi.1978, G. Daniels (MEI 028133) (GDCB); **Australian Capital Territory:** one female, Canberra, base of Black Mtn, 12.xi.1983, M.E. Irwin (MEI 0028134) (ANIC).

**Diagnosis and description.** See genus diagnosis and description.

**Etymology.** Specific epithet is derived from the Greek: *onyx* – claw or talon, referring to the outer gonocoxal process shape.

**Distribution.** *Actenomeros onyx* sp. n. is known from New South Wales and the Australian Capital Territory (Fig. 73).

### *Actenomeros corniculaticaudus* Winterton and Irwin, sp. n. (Figs 10–15,74)

**Types. Tasmania:** holotype male, Mt Barrow, 12.xii.1998, D. Yeates (MEI 090751) (ANIC). Condition: good. Paratypes: one male, same data as holotype (MEI 090752) (ANIC); one female, Pelion Hut, 3 km S Mt Oakleigh, 8.i-12.ii.1991, A. Calder, W. Dressler, Malaise (MEI 028135) (ANIC).

**Diagnosis and description.** See genus diagnosis and descriptions except: *Male genitalia* (Figs 10–15): outer gonocoxal process slightly shorter than gonostylus; gonostylus with 2 narrow ventral processes midway along length, medial process larger than laterad process.

**Etymology.** Specific epithet derived from the Latin: *corniculatus* – horn shaped; and *cauda* – tail.

**Distribution.** *Actenomeros corniculaticaudus* sp. n. is known only from northern Tasmania (Fig. 74).

### *Taenogera* Kröber

*Taenogera* Kröber 1912a: 118 (key) 1912b: 150 (description); Mann 1928: 163; Irwin & Lyneborg 1989: 358 (catalogue).

**Type species.** *Taenogera longa* Kröber (= *Anabarhynchus nitidus* Macquart).

**Diagnosis.** Male frons width almost equal to female, fine

pale setae present dorsally; multiple rows of postocular setae in male and female, occiput with silver or gold velutum; abdomen with triangular patches of silver velutum laterally on tergites 2–4; distiphallus broad, parallel sided, parameral sheath not fused along ventral surface of distiphallus.

**Redescription.** Head: Frons broad, width at narrowest point wider than ocellar tubercle, very little sexual dimorphism in frons width, frons black, either rounded or wrinkled, fine pale setae dorsally near ocellar tubercle, lower frons with gold or silver velutum starting just above the antennal base; occiput broadly convex, becoming concave around occipital foramen, integument dark, covered with silver-white or gold velutum; postocular ridge with silver velutum extending down to gena; multiple, poorly defined rows of dark or pale postocular setae; gena with long pale setae; palp orange or yellow with dark setae; antennae orange or yellow, scape length equal to or slightly shorter than flagellum, four times as long as pedicel; short dark setae on scape and pedicel, flagellum tapering, 'onion' shaped, laterally compressed, flagellar style terminal.

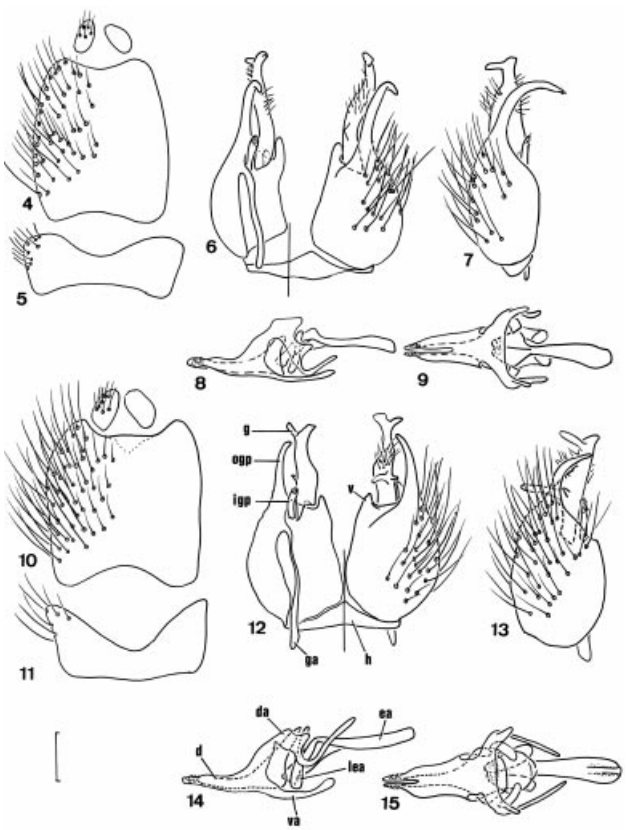
Thorax: scutum black, usually glossy, patterned with white stripes or gold patches of velutum, sometimes glabrous, scutellum black or yellow; leg colour variable, hind femur with antero-ventral setae present; haltere yellow to brown; wing smoky infuscate, cell $m_3$ open (i.e. vein $M_3$ not joining vein $CuA_1$). Scutal chaetotaxy (range): np, 3–4; sa, 2; pa, 1–2; dc, 1–5; sc, 1–5.

Abdomen: triangular silver velutum patches laterally on tergites 2–4, velutum extending dorsally over posterior margin of tergite; long pale setae laterally on tergites 1–6.

Male genitalia (Figs 16–34): epandrium quadrangular, length at midline equal to width, narrowed posteriorly, anterior margin slightly emarginate; tergite 8 quadrangular, not emarginate, spiracular opening located anterolaterally on tergite, large number of setae directed posteriorly on posterolateral corners; gonocoxite with outer gonocoxal process present, shorter than inner gonocoxal process; hypandrium triangular, corners fused antero-medially to gonocoxites, glabrous; gonocoxal apodeme present, not enlarged; inner gonocoxal process slightly spatulate apically, small subapical setae directed ventrally; gonostylus with ventrally and medially directed setae, small dorsal spur located midway along gonostylus sometimes present; ventral lobe present, close to mid-line, glabrous; distiphallus short, broad, cylindrical, straight, numerous small spines distally; dorsal apodeme 'T' shaped; parameral sheath split medially half way along dorsal surface and completely along ventral surface, arms of ventral apodeme not fused medially; lateral ejaculatory apodemes long, narrow, without lateral projections; base of ejaculatory apodeme broad, oval shaped.

Female genitalia: six to eight A1 setae, seven to 10 A2 setae; anterior margin of tergite 8 with broad, tongue-like process, sternite 8 with dark setae randomly distributed, not patterned; furca sclerotised in a ring, sometimes lacking sclerotisation anteriorly: that is, open; spermathecae large, sub spherical, spermathecal ducts arranged basally on spermathecal sac duct close to furca; spermathecal sac trilobate (Fig. 40), median sac constricted midway to form two sacs; two accessory glands, paired, joining to form common duct before joining furca posterior to spermathecal sac duct.

**Comments.** Large, elongate species (body length: 12–15 mm). Three species of very similar appearance are recognised: *T. longa*, *T. nitida* and *T. notatithorax*. The male and female genitalia are almost identical between species of *Taenogera*. Consequently, they are not dealt with further in the species descriptions. All species have been rarely collected. *Taenogera* was first listed in a key to genera in Kröber (1912a), but the genus described in Kröber (1912b). A female specimen (MEI 027819) of an undescribed species of *Taenogera* is in the University of Queensland Insect Collection. The specimen is from Malanda, northern Queensland, but is not described here as male specimens are not available.




***Figs 4–15.*** *Actenomeros* spp. **(4–9)** *A. onyx* sp. n. male genitalia: **(4)** epandrium, dorsal view; **(5)** tergite 8, dorsal view; **(6)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(7)** gonocoxite, lateral view; **(8)** aedeagus lateral view; **(9)** aedeagus, dorsal view. **(10–15)** *A. corniculaticaudus* sp. n. male genitalia; **(10)** epandrium, dorsal view; **(11)** tergite 8, dorsal view; **(12)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(13)** gonocoxite, lateral view; **(14)** aedeagus, lateral view; **(15)** aedeagus, dorsal view. Scale bar = 0.2 mm. Abbreviations: igp, inner gonocoxal process; ogp, outer gonocoxal process; g, gonostylus; h, hypandrium; ga, gonocoxal apodeme; v, ventral lobe; da, dorsal apodeme of parameral sheath; va, ventral apodeme of parameral sheath; lea, lateral ejaculatory apodeme; d, distiphallus; ea, ejaculatory apodeme.

This species has the same scutal and facial patterning as *T. longa* and *T. notatithorax*, but has a yellow abdomen with dark banding, and pigmented anterior margins to the wings.

### *Taenogera longa* (Schiner) (Figs 16–22,40,73)

*Anabarhynchus longus* Schiner (1868): 149.
*Taenogera longa* (Schiner) – Irwin & Lyneborg 1989: 358 (catalogue).
**Types. New South Wales:** one male and one female syntypes, Sydney, in copula (NMW). Condition: Pinned together, both specimens damaged, abdomens missing – examined.
**Other material examined. New South Wales:** 10 males, four females, Warrumbungle National Park, 7.xi.1997, S. Winterton, J. Skevington, Malaise trap nr Woolshed (MEI 090768–81) (UQIC); one male, Ku-Ring-Gai, 14–19.x.1972, E.A. Fonseca (MEI 032014) (NHM).
**Diagnosis.** Scutum glossy black with gold velutum patches; katepisternum glabrous; legs orange; abdominal tergites 2–3 dark orange; female genitalia black.
**Redescription. Male.** Head: Frons glossy black, rounded, sparse fine setae dorsally, frons wider than ocellar tubercle at narrowest point; occiput dark, covered with gold velutum; multiple, poorly defined rows of yellow postocular setae; postocular ridge and gena with silver velutum, long yellow setae on lower gena; palp orange with black setae, two-segmented; antennae orange; scape slightly shorter than flagellum, four times as long as pedicel, cylindrical with four to five dark setae admixed with pale setae; pedicel with band of short, dark setae; flagellum tapered, flattened laterally.

Thorax: Scutum glossy black, patches of gold velutum similar to *T. notatithorax*, patches connected in some individuals to form two longitudinal stripes, short, pale setae sparsely distributed over scutum; scutellum dark yellow, black anteriorly; pleuron glossy black, gold velutum on proepimeron and proepisternum, silver velutum on pteropleural callus and metepimeron; coxae black with thin covering of silver velutum; wing hyaline, smoky brown infuscation, darker towards apex, venation dark; haltere brown; legs orange, fore tarsi and base of fore tibia black; femora and tibia with fine white setae. Scutal chaetotaxy: np, 4; sa, 2; pa, 1; dc, 1; sc, 1; scutal bristles pale.

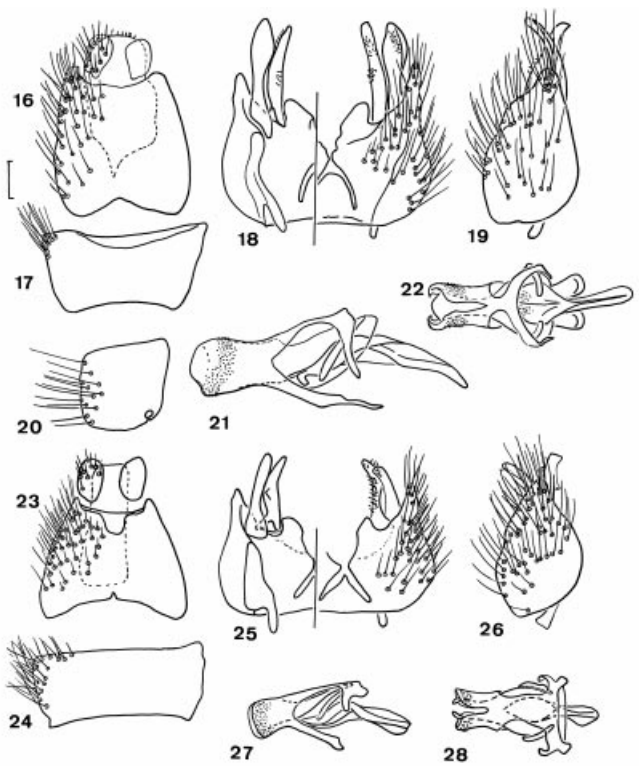
Abdomen: Tergites 2–3 dark orange, segments 1, 5–8 and genitalia glossy with black setae, silver triangular patches of velutum laterally on tergites 2–4.

Genitalia (Figs 16–22): see genus description.

**Female.** Same as male except frons slightly wider than male.

Genitalia (Fig. 40): see genus description.

**Distribution.** *Taenogera longa* is known only from eastern and north-central New South Wales (Fig. 73). A large series was collected in Warrumbungle National Park.




***Figs 16–28.*** *Taenogera* spp. **(16–22)** *T. longa* (Schiner) male genitalia: **(16)** epandrium, dorsal view; **(17)** tergite 8, dorsal view; **(18)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(19)** gonocoxite, lateral view; **(20)** tergite 8, lateral view; **(21)** aedeagus, lateral view; **(22)** aedeagus, dorsal view. **(23–28)** *T. nitida* (Macquart) male genitalia: **(23)** epandrium, dorsal view; **(24)** tergite 8, dorsal view; **(25)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(26)** gonocoxite, lateral view; **(27)** aedeagus lateral view; **(28)** aedeagus, dorsal view. Scale bar = 0.2 mm.

### *Taenogera nitida* (Macquart) (Figs 23–28,73)

*Anabarhynchus nitidus* Macquart 1850: 404 (100), plate 9, Fig. 12.
*Anbarrhynchus nitidus* Macquart – Mann 1928: 164 (incorrect spelling of synonym).
*Taenogera longa* Kröber 1912b: 151, Figs 4,5 (preoccupied Schiner 1868).
*Taenogera nitidus* (Macquart) – Mann 1928: 164, Fig. 3(a).
*Taenogera nitida* (Macquart) – Irwin & Lyneborg 1989: 358.
**Types. Tasmania:** one male and one female syntypes (MNHN). Condition: fair – examined.
**Other material examined. Queensland:** one female, Clovelly, 30.ix.1950, W.E. Wright (MEI 027821) (ASCT); **New South Wales:** one male, one female, Bronte, nr Sydney 12.ix.1970, D.K. McAlpine, in copula linear position (MEI 027828, 027827) (AM); two females, Sydney, Sept.–Oct. 1902 (MEI 027822, 027823) (BPBM).
**Diagnosis.** Scutum with two diffuse white stripes, without gold velutum patches; pleuron with fine grey pruinescence; scutellum dark, three to four pairs of bristles; femora black; abdomen entirely black.
**Redescription. Male.** Head: Frons black, wrinkled, sparse fine hairs, frons width at narrowest point wider than ocellar tubercle; occiput dark, covered with silver-white velutum; multiple, poorly defined rows of pale postocular setae; gena

with silver velutum, long white setae on lower gena; palp with thin silver velutum and sparse black setae, two-segmented; antennae colour dark, fine silver velutum; scape length equal to flagellum, four times as long as pedicel, cylindrical, four to five dark setae admixed with fine white setae; pedicel with band of short, dark setae; flagellum tapered, flattened laterally.

Thorax: Scutum black, glossy, two white pruinescent stripes along dorsocentral line, lines fading posteriorly and replaced by diffuse white pruinescence medially, fine white setae sparsely distributed over scutum; scutellum black, thin grey pruinescence; pleuron dark brown, covered with grey pruinescence; coxae and pteropleural callus with silver velutum and long, fine, white setae; wing hyaline with slight smoky infuscation, venation dark; haltere brown; femora, fore tibia and fore tarsi dark brown, mid-and hind tibia and tarsi dark yellow. Femora and tibia with fine white setae. Scutal chaetotaxy: np, 3; sa, 2; pa, 2; dc, 4–5; sc, 3–4.

Abdomen: All segments dark brown-black, intersegmental membranes light brown, genitalia black.

Genitalia (Figs 23–28): see genus description.

**Female.** Same as male except: frons slightly wider than male; pale hairs on scutum shorter than male; long pale hairs on abdomen absent.

Genitalia (cf., Figure 40): see genus description.

**Comments.** Mann (1928) synonymised *T. longa* Kröber under *T. nitida*. The female holotype of *T. longa* Kröber was lodged in the Hamburg Museum and subsequently destroyed during the Second World War, so the decision by Mann cannot be confirmed but appears correct from the redescription.

**Distribution.** *Taenogera nitida* is known from southern Queensland and Sydney, New South Wales (Fig. 73).

### *Taenogera notatithorax* Mann (Figs 29–36,73)

*Taenogera notatithorax* Mann 1928: 169; Hardy 1939: 47; Irwin & Lyneborg 1989: 358.

**Types. Queensland:** holotype female, Tamborine Mountain, W.H. Davidson, D 3265 (MEI 027817) (QM). Allotype female, same data as holotype (MEI 027820) (QM). Condition of types: fair. Holotype with right wing detached, glued to label, right antennal flagellum missing, left fore and mid legs missing, right fore leg glued to pith. Allotype with left wing detached glued to label, genitalia in genitalia vial attached to pin, left hind and fore legs missing.

**Other material examined. Queensland:** one female, Beerwah, 28.viii.1952, DJT (MEI 027818) (UQIC); one female, Toowoomba, 24.x.1963, J.C. Cardale (MEI 090717) (UQIC); one female, Scrub Road, Brisbane Forest Park (27°25´S, 152°50´E), 25.xi.1997, S. Winterton, N. Power, Malaise trap (MEI 090718) (UQIC); **New South Wales**: two males, 24 km W Grafton, 8.ix.1983, D. Yeates, hilltop (MEI 027816, 027814) (UQIC).

**Diagnosis.** Scutum glossy black with gold velutum patches; katepisternum with patch of gold velutum in upper section; abdominal segments 2–4 bright orange.

**Redescription. Male.** Head (Fig. 36): frons glossy black, rounded, sparse fine setae dorsally, frons wider than ocellar tubercle at narrowest point, spot of velutum above each antennal base with velutum facing a different direction to rest therefore appearing dark at certain angles; occiput dark, covered with silver-white velutum; multiple, poorly defined rows of pale or dark postocular setae; postocular ridge and gena with silver velutum, long yellow setae on lower gena; palp dark yellow with black setae, two-segmented; antenna yellow; scape slightly shorter than flagellum, four times as long as pedicel, cylindrical with four to five dark setae; pedicel with band of short, dark setae; flagellum tapered, flattened laterally.

Thorax (Fig. 35): scutum glossy black, patches of gold velutum arranged as in Fig. 35, sparsely distributed short, dark setae; scutellum dark yellow, black anteriorly; pleuron glossy black, gold velutum on pteropleural callus, proepimeron, proepisternum, upper section of katepisternum and metepimeron; coxae yellow with thin covering of silver velutum; wing hyaline, faint yellow infuscation, darker towards apex, venation dark; haltere yellow; legs yellow, tarsi darkened distally, fore tarsi and base of fore tibia black; femora and tibia with fine white setae. Scutal chaetotaxy: np, 4; sa, 2; pa, 1; dc, 1; sc, 1; scutal bristles pale or dark.

Abdomen: segments 2–4 and most of segment 1 bright orange, segments 5–8 and genitalia glossy with black setae.

Genitalia (Figs 29–34): see genus description.

**Female.** Same as male except: frons entirely glabrous dorsally, slightly wider than male; scutum entirely glabrous except for bristles; wing pterostigma dark; abdominal segment 4 black; tergite 8 orange in some individuals.

Genitalia (cf. Fig. 40): see genus description.

**Comments.** The holotype is recorded and labelled by Mann as a male but is a female. This species is closely related to *T. longa*. Females have been collected in Malaise traps in drying creek beds, while males have been collected at hilltops.

**Distribution.** *Taenogera notatithorax* has been collected in south-eastern Queensland and northern New South Wales (Fig. 73).

### *Taenogerella* Winterton and Irwin, gen. n.

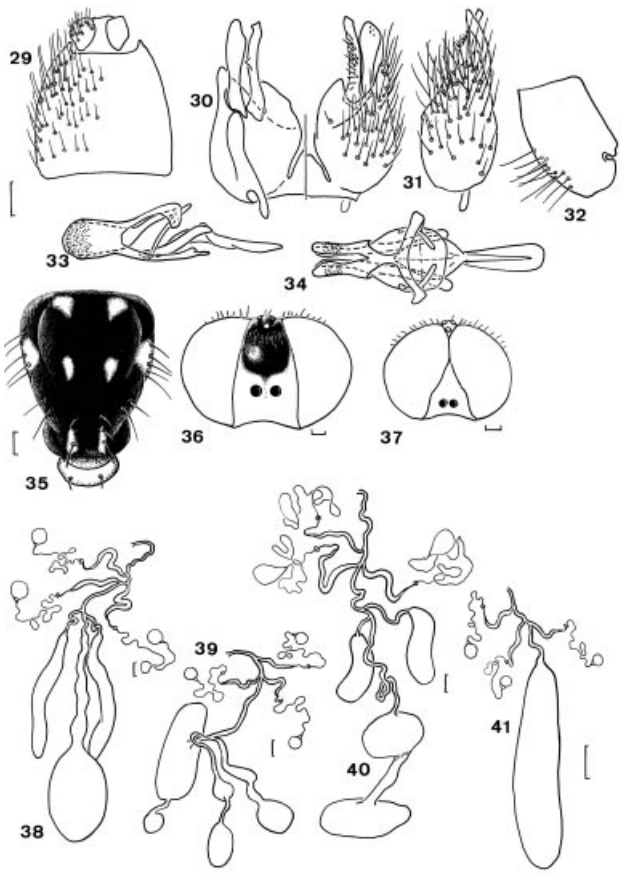
**Type species.** *Taenogera nigrapicalis* Mann 1928: 165, Fig. 3(c).

**Diagnosis.** Male frons greatly narrowed, covered with bright silver velutum, numerous large setae around base of antenna and on scape; gonocoxites with large medial atrium; hypandrium fused to gonocoxites; apex of gonostylus directed dorsally; outer gonocoxal process longer than inner gonocoxal process; male abdominal velutum extensive or restricted to posterior margins of tergites; distiphallus broadly tapering, apex directed ventrally.

**Description.** Head: male frons greatly narrowed, eyes occasionally contiguous, female frons wider than male, frons covered with bright silver velutum, silver-bronze coloured in female, numerous large setae around base of antenna and on scape, setae larger in male; occiput concave, grey-green

pruinescent; one to two rows of postocular setae; gena with long white setae and silver velutum; palp pale orange with pale setae; scape slightly shorter than flagellum, grey-brown, silver velutum present or absent, numerous long, dark setae; pedicel much shorter than scape, short dark setae; flagellum tapering, laterally compressed, grey-bronze pruinescent, style dark.

Thorax: scutum black or grey-green pruinescent; longitudinal stripe in form of two diffuse pale dorsocentral stripes or broad silver velutum stripe; scutellum black with grey pruinescence, short scattered setae of scutum, shorter in female; pleuron integument colour dark, silver velutum covering, numerous long, pale setae present on proepisternum, proepimeron, anepisternum, katepisternum, pteropleural callus and coxae; legs generally pale yellow, tarsi darkened distally; haltere pale yellow or brown; wing hyaline, costal cells sometimes infuscate, venation dark. Scutal chaetotaxy: np, 3–5; sa, 1; pa, 1; dc, 0–9; sc; 1–2.




***Figs 29–41.*** **(29–34)** *Taenogera notatithorax* Mann male genitalia: **(29)** epandrium, dorsal view; **(30)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(31)** gonocoxite, lateral view; **(32)** tergite 8, lateral view; **(33)** aedeagus lateral view; **(34)** aedeagus, dorsal view. **(35–36)** *T. notatithorax*: **(35)** thorax, dorsal view (**36)** face, anterior view. **(37)** *Taenogerella elizabethae* sp. n., face, anterior view. **(38–41)** Female spermathecal sacs: **(38)** *Nanexila gracilis* (Mann); **(39)** *Taenogerella platina* sp. n.; **(40)** *Taenogera longa* (Schiner); **(41)** *Taenogerella elizabethae* sp. n. Scale bar = 0.2 mm.

Abdomen: colour variable, entirely black to entirely yellow or a combination of dark and pale segments, tergite 1 black; silver velutum present as bands on segments 1–7, completely covering segment in *Ta. nigrapicalis*, velutum more extensive in male, restricted to intersegmental membranes in female; long pale setae laterally on segments 1–4–1–7 in male, absent in female; genitalia dark or pale.

Male genitalia: epandrium quadrangular, elongate, anterior margin slightly emarginate, setae all one size; tergite 8 emarginate, spiracular pore absent, several posteriorly directed setae on posterolateral corners; gonocoxite with outer gonocoxal process enlarged forming a large posterior atrium, longer than inner gonocoxal process; hypandrium relatively small, almost totally fused laterally to gonocoxites, glabrous; gonocoxal apodeme present, not enlarged; inner gonocoxal process narrow, sometimes slightly spatulate apically, glabrous; gonostylus large, numerous strong, ventrally directed setae, sclerotised spur approximately halfway along dorsal surface with numerous strong setae; ventral lobe small, lobes widely separated away from midline, second ridge or lobe sometimes present ventromedially; distiphallus relatively long, broad basally, tapered apically, apex directed ventrally, spines absent; dorsal apodeme 'T' shaped, secondarily forked distally; lateral ejaculatory apodemes long, narrow, without lateral projections; base of ejaculatory apodeme relatively small, oval shaped.

Female genitalia: six to eight A1 setae, five to 12 A2 setae; anterior margin of tergite 8 with narrow tongue-like process, sternite 8 with dark setae randomly distributed, not patterned; furca sclerotised in a ring, weakly sclerotised anteriorly: that is, open; spermathecae spherical, spermathecal ducts arranged basally on spermathecal sac duct close to furca; spermathecal sac simple (Fig. 41) or trilobate (Fig. 39) with median sac constricted midway to form smaller distal sac; two accessory glands, paired, joining to form common duct before joining furca posterior to spermathecal sac duct.

**Etymology.** *Taenogerella* is the Latin diminutive of *Taenogera*. Gender is female.

**Comments**. Three species are described as new: *Ta. elizabethae* sp. n., *Ta. schlingeri* sp. n. and *Ta. platina* sp. n., with *Ta. nigrapicalis* transferred from *Taenogera*. Closely related to *Taenogera*, species of *Taenogerella* are easily distinguished by their relatively smaller size, single row of postocular setae in the male and differences in the male genitalia.

### *Taenogerella elizabethae* Winterton and Irwin, sp. n. (Figs 37,41–49,74)

**Types. Queensland:** holotype male, 4 km SE Glen Aplin, 22.xi.1980, G.D. Daniels, M.A. Schneider, m[ercury] v[apour] lamp (MEI 027883) (QM). Condition: very good. Paratypes: six males, 10 females, Boggomoss 8, Taroom District (25°27′S, 150°02′E), 12.xi.1996, C.J. Burwell, S. Evans (QM); one male, Amiens, nr Stanthorpe, 25.xi.1979, G. Daniels (MEI 027919) (GDCB); one female, Stanthorpe, 21.i.1930 (MEI 033881) (UQIC); one female, Carnarvon National Park, Mt Moffatt Section, Marlong Cr nr Lots Wife,

site 13 (24°58´S, 147°57´E), 760 m amsl, 25.xi.1995, M. Irwin, S. Gaimari, 9 m Fockes trap (MEI 031401) (IRWC); one female, Kroombit Tops, 45 km SSW Calliope, 3.ii.1984, D.K. Yeates (MEI 027914) (UQIC).

**Other material examined. New South Wales:** three males, 22 females, Warrumbungle National Park, Wombelong Creek at Woolshed, 27.xii.1987, M.E. Irwin (MEI 027875, 027878–82, 027888–97, 027908–13, 027915–16, 027918) (IRWC); one male, Mt Waigoon, 900 m, 23.xii.1962, E.S. Ross, D.Q. Cavagnaro (MEI 027872) (CASC); one male, 4 miles S Glencoe, 1280 m, 29.xi.1962, E.S. Ross, D.Q. Cavagnaro (MEI 027873) (CASC); one male, 9.3 km S Ilford, 29.xii.1977, G. Daniels (MEI 027885) (GDCB); one female, Kandos Weir, 30.xii.1977, G. Daniels (MEI 027907) (GDCB); one male, one female, 7.5 km SW of Molong (33°08´S, 148°49´E), 25.i.1986, G. and A. Daniels (MEI 027870–1) (GDCB); three males, one female, Mt Kaputar National Park, Eulah and Bullawa Creeks, 15–19.i.1994, Irwin and Yeates, Malaise trap (MEI 028033, 028035–6, 028055) (IRWC); two males, nine females, Urila, 26 km S Queanbeyan, 16–24.xii.1987, M.E. Irwin, ex. Malaise trap (MEI 027876–77, 027900–05, 027920–22) (IRWC).

**Diagnosis.** Scutum silver-grey velutum in male, grey pruinescent in female; less than two pairs of dorsocentral bristles, usually none; one pair of scutellar bristles; abdomen orange-brown to black, intersegmental membranes with silver velutum; spermathecal sac simple; costal margin of wing infuscate.

**Description. Male.** Head (Fig. 37): eyes contiguous, frons very narrow, covered with bright silver velutum, long dark setae around base of antennae; ocellar tubercle grey pruinescent; occiput concave, grey-green pruinescent, one row of dark, postocular setae; gena with silver velutum and long, white setae; palp orange with pale setae; scape slightly shorter than flagellum, pale brown, numerous long, dark setae; pedicel much shorter than scape, short dark setae; flagellum bronze pruinescent, without setae.

Thorax: scutum and scutellum with silver-grey velutum, numerous fine, dark, setae scattered over scutum; pleuron dark brown with silver velutum except anepimeron, katepimeron and meron; fore coxa yellow, mid and hind coxae brown, coxae with silver velutum covering, setae black; fore and mid legs pale yellow, tarsi darkened distally, hind leg dark brown, colour variable; haltere brown; wing hyaline, costal margin brown infuscate, venation dark. Scutal chaetotaxy: np, 3–4; sa, 2; pa, 1; dc, 0–2; sc 1.

Abdomen: colour orange-brown to black, tergites 1–5 with thin band of silver velutum on intersegmental margin; tergites 1–2 with long, fine, white setae laterally; genitalia dark brown-black, covered in black setae.

Genitalia (Figs 42–49): epandrium quadrangular, elongate; tergite 8 emarginate, several setae directed posteriorly on posterolateral corners; gonocoxite without secondary ventral ridge; inner gonocoxal process narrow, spatulate apically; gonostylus large, spur approximately halfway along dorsal ridge enlarged, lobate with numerous setae; distiphallus relatively long, narrower than other species, apex directed ventrally, without projections; lateral ejaculatory apodemes long, narrow, weakly sclerotised.

**Female.** Same as male except: frons wider than ocellar tubercle, silver-bronze velutum, small dark setae scattered dorsally over frons, dark setae around base of antennae reduced or absent, area just dorsal to antenna dark brown, glabrous; one to two rows of postocular setae; scutum grey-silver pruinescent; abdomen with short, dark setae sparsely distributed over all segments.

Genitalia (Fig. 41): furca elongate, not sclerotised anteriorly; spermathecal sac simple, spermathecae arranged basally on spermathecal sac duct.

**Comments.** A slender species closely related to *Ta. platina* sp. n. The contiguous eyes of the male separate this species from the other species of *Taenogerella*.

**Etymology.** The species epithet is proposed in honour of Elizabeth Joanna Goss.

**Distribution.** *Taenogerella elizabethae* sp. n. has been collected in eastern New South Wales and south-eastern Queensland but with only one record from a coastal region (Fig. 74). Large series of this species have been collected in Warrumbungle National Park, New South Wales.

### *Taenogerella nigrapicalis* (Mann), comb. n. (Figs 58–65,74)

*Taenogera nigrapicalis* Mann 1928: 165, Fig. 3(c); Irwin & Lyneborg 1989: 358.

**Type. South Australia:** holotype female, Karoonda to Peebinga, G.E. Wright (MEI 090782) (SAM). Condition: good; card mounted, right wing glued to card, flagellum microslide mounted.

**Other material examined. New South Wales:** two males, two females, 3 km NW of Bramah H.S. [homestead], NW of Balranald (43°24´S, 143°14´E), 24.x.1983, D.C.F Rentz and M.S. Harvey, stop 35, ex ethanol via cellusolve-xylene (MEI 028123, 028124, 028127, 028128) (IRWC); **Victoria:** one female, 13 km S Pirlta, 18.x.1983, J.C. Cardale, at light (MEI 028121) (IRWC); **Western Australia:** two males, 8 km NE Tamala H.S. (26°42´S, 113°43´E), 21–23.viii.1980, C.A. Howard and T.F. Houston, 334–1, at light (WAM 87/2/13–14); one male, one female, Boorabbin Rock (31°12´S, 120°17´E), 4–9.x.1981, T.F. Houston, 408–2, at light (WAM 87/2/17–18); 4 males, one female, Boorabbin Rocks, 97.6 km E Southern Cross, 5.x.1981, R.W. Thorp (MEI 028115–18, 028122) (UCDC); one male, 19 miles NE Mundrabilla H.S., 16.x.1968, Britton, Upton and Balderson (MEI 028654); one female, 20 miles N Broad Arrow, 325 m, 17.ix.1962, E.S. Ross and D.Q. Cavagnaro (CASC).

**Diagnosis.** Scutum black with two diffuse white stripes; scutellum with two pairs of bristles; six to nine pairs of dorsocentral bristles; abdomen pale yellow in male, segments 6–8 and genitalia black in female; male abdominal velutum extensive, covering most of tergites; spermathecal sac simple; costal margin of wing hyaline.

**Redescription. Male.** Head: frons very narrow, covered with bright silver velutum, long, dark setae around base of

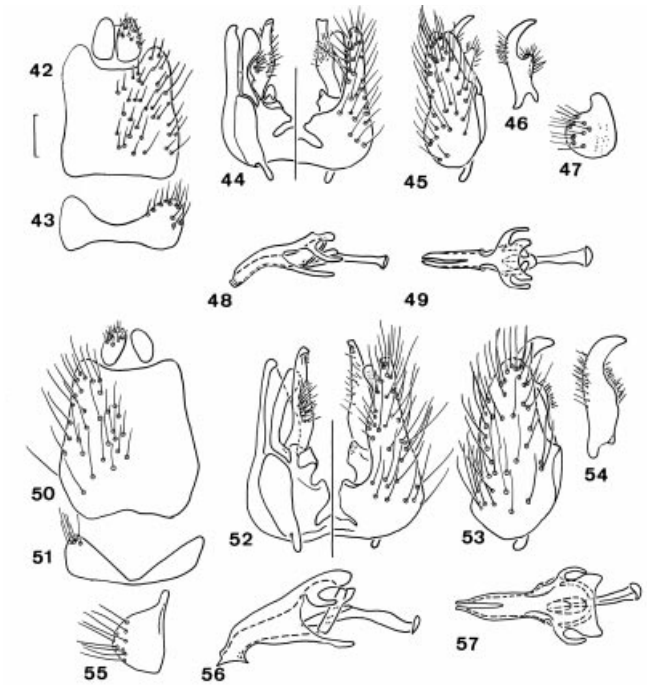
antennae; ocellar tubercle grey pruinescent, numerous long setae; occiput concave, grey-silver pruinescent, single row of dark, postocular setae, multiple long, pale recumbent setae; gena with silver velutum and numerous long, white setae; palp orange with pale setae; scape slightly shorter than flagellum, silver velutum, numerous long, dark setae; pedicel much shorter than scape, silver pruinescent, short dark setae; flagellum grey-brown pruinescent, with several dark setae basally.

Thorax: scutum and scutellum black with grey pruinescent covering, two diffuse white stripes along dorsocentral lines, area between stripes yellowed posteriorly, lateral margins with silver velutum, numerous fine, dark, setae scattered over scutum; pleuron and coxae integument colour black, covered with bright silver velutum, proepisternum, proepimeron, anepisternum, katepisternum, pteropleural callus and coxae with numerous, long, white setae; legs pale yellow, tarsi darkened distally; haltere pale yellow; wing hyaline, venation dark. Scutal chaetotaxy: np, 4–5; sa, 1; pa, 1; dc, 6–9; sc, 2.

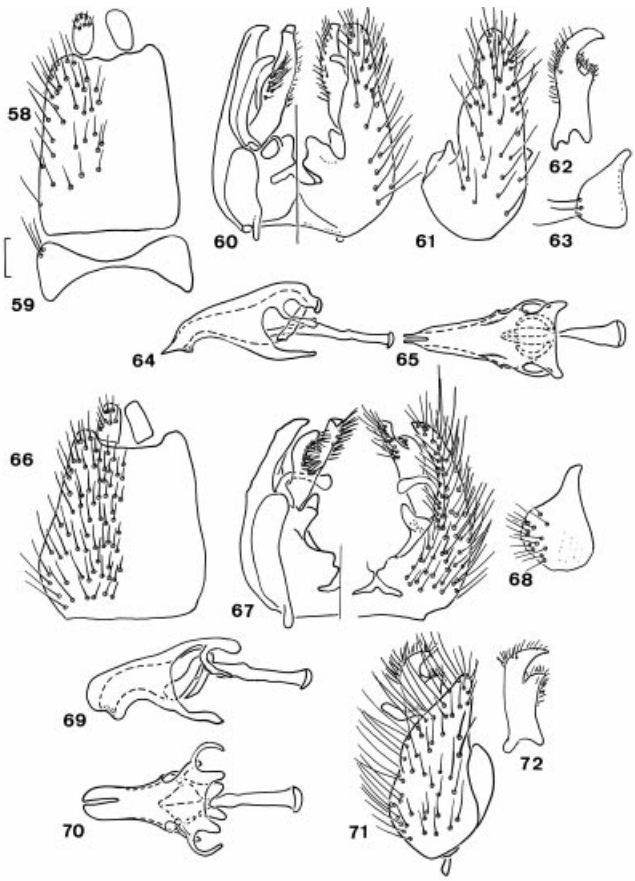
Abdomen: pale yellow, tergites 1–6 with extensive bright silver velutum, anterior margin of tergite without velutum; sternites 1–6 with silver velutum; segments 1–4 with numerous long, fine, white setae laterally and ventrally; genitalia orange-yellow, covered in black setae.

Genitalia (Figs 58–65): gonocoxite with secondary ventral ridge, larger than *Ta. schlingeri* sp. n.; inner gonocoxal process narrow, not spatulate apically; gonostylus large, spur developed as dorsal ridge with series of large setae; distiphallus relatively long, apex directed ventrally at 90°, small dorsal and ventral projections.

**Female.** Same as male except: frons wider than ocellar tubercle, silver-bronze velutum, small dark setae scattered dorsally over frons, dark setae around base of antennae shorter than male; occiput without white recumbent setae, scattered dark setae present; scattered setae on scutum shorter than in male; abdomen with silver velutum only on intersegmental membranes of tergites 1–5, tergite 1 dark brown-black, segments 2–5 orange, segment 5 dark brown-black in some individuals or with traces of dark colouration; short, dark setae sparsely distributed over segments.




***Figs 42–57.*** *Taenogerella* spp. **(42–49)** *Ta. elizabethae* sp. n. male genitalia: **(42)** epandrium, dorsal view; **(43)** tergite 8, dorsal view; **(44)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(45)** gonocoxite, lateral view; **(46)** gonostylus, left lateral view; **(47)** tergite 8, lateral view; **(48)** aedeagus lateral view (**49)** aedeagus, dorsal view. **(50–57)** *Ta. schlingeri* sp. n. male genitalia: **(50)** epandrium, dorsal view; **(51)** tergite 8, dorsal view; **(52)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(53)** gonocoxite, lateral view; **(54)** gonostylus, left lateral view; **(55)** tergite 8, lateral view; **(56)** aedeagus, lateral view; **(57)** aedeagus, dorsal view. Scale bar = 0.2 mm.




***Figs 58–72.*** *Taenogerella* spp. **(58–65)** *Ta. nigrapicalis* (Mann) male genitalia: **(58)** epandrium, dorsal view; **(59)** tergite 8, dorsal view; **(60)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(61)** gonocoxite, lateral view; **(62)** gonostylus, left lateral view; **(63)** tergite 8, lateral view; **(64)** aedeagus, lateral view; **(65)** aedeagus, dorsal view. **(66–72)** *Ta. platina* sp. n. male genitalia: **(66)** epandrium, dorsal view; **(67)** gonocoxite, dorsal view (left), ventral view (right), epandrium and aedeagus removed; **(68)** tergite 8, lateral view; **(69)** aedeagus, lateral view; **(70)** aedeagus, dorsal view; **(71)** gonocoxite, lateral view; **(72)** gonostylus, left lateral view. Scale bar = 0.2 mm.

Genitalia (cf. Fig. 41): furca weakly sclerotised anteriorly; spermathecal sac simple; spermathecae arranged basally on spermathecal sac duct.

**Distribution.** *Taenogerella nigrapicalis* is distributed throughout southern mainland Australia (Fig. 74).

### *Taenogerella platina* Winterton and Irwin, sp. n. (Figs 39,66–72,75)

**Types. Queensland:** holotype male, Isla Gorge National Park (25°11´S, 149°58´E), 12.ix.1992, 320 m, G. Daniels, mv lamp (MEI 033699) (AM). Condition: very good. Paratypes: two males, one female, Lake Broadwater nr Dalby, site A (27°21´S, 151°06´E), 27.ix.1986, G. and A. Daniels, mv lamp (MEI 028068, 28070, 028088) (GDCB); one female, Girraween National Park, 1–2.xii.1981, G.D. Daniels, M.A. Schneider (MEI 028091) (UQIC); one male, one female, The Toombs, Mt Moffatt Section, Carnarvon National Park, 27.ix.1986, D.K. Yeates (MEI 028057, 028087) (UQIC); one male, two females, Goondiwindi, 2.xi.1934, A.G. Turner (MEI 028071, 028076–7) (QM); 11 males, eight females, Isla Gorge National Park (25°11´S, 149°58´E) various dates 11.ix-4.x.1992, 320 m, G. Daniels, mv lamp [one pair in copula] (MEI 033692–98, 033700–13) (GDCB); one female, Mt Moffatt Section, Carnarvon National Park, Chimneys/Cathedral Rock, 21.ix.1986, Monteith, Yeates, Thompson (MEI 033875) (QM).

**Other material examined. New South Wales:** three males, Apsley Falls, nr Walcha, 975 m, 30.xi.1962, E.S. Ross, D.Q. Cavagnaro (MEI 028061–63) (CASC); one female, Goondera Ridge, Royal National Park, 28.x.1978, G. and A. Daniels (MEI 028092) (GDCB); three females, Urila, 28 km S Queanbeyan, 26.xii.1987, M.E. Irwin, ex. Malaise trap (MEI 028084–6) (IRWC); two males, one female, Mt Waigoon, 900 m, 23.xii.1962, E.S. Ross, D.Q. Cavagnaro (MEI 028060, 028069, 028072) (CASC); six males, 34 females, Warrumbungle National Park, Buckleys Creek, 1.7 km N Camp Blackman, 480 m various dates: 24.xii. 1992–2.i.1993, 6 m grey Malaise trap across road north of first creek crossing, open, dry Eucalyptus woodlands, M.E. Irwin (MEI 027829–69) (IRWC); three males, Warrumbungle National Park, NE Buckleys Creek, 1.5 km N Camp Blackman, 17.xii.1995, M.E. Irwin (MEI 051576, 051817, 052048) (IRWC); six males, 11 females, Warrumbungle National Park, NE Browns Creek, 2.5 km N Woolshed, 16–17.xii.1995, M.E. Irwin, collected in Malaise trap (MEI 035701–6, 039365, 039501, 039626, 048706, 048670, 051359, 051412, 051622, 051635, 051647, 052053) (IRWC); one female, Katoomba, Blue Mountains, 3000–3300 ft, Dodd junior, Jan.1912 (MEI 032051) (NHM); **Australian Capital Territory:** one male, Black Mountain, 14.xii.1960, I.F.B. Common, light trap (MEI 028064) (ANIC); two males, 10 females, Black Mountain 600 m (35°16´S, 149°06´E) various dates: 15.xii.1987–24.i.1988, M.E. Irwin, ex Malaise trap (MEI 028056, 028058, 028074, 028078–83, 028089–90, 028094) (IRWC); **Victoria:** two males, one female, Chiltern, 3.xii.1958, I.F.B. Common (MEI 028065, 028067, 028093) (IRWC).

**Diagnosis.** Scutum with median stripe of velutum; scutellum with one pair of bristles; two pairs of dorsocentral bristles; abdomen black; spermathecal sac trilobate; abdominal velutum as band on posterior margin of segments 1–5; costal margin of wing hyaline.

**Description. Male.** Head: frons narrow, covered with bright silver velutum, long dark setae around base of antennae; ocellar tubercle with grey pruinescence; occiput concave, grey-green pruinescent, two rows of dark, postocular setae; gena with silver velutum and long, white setae; palp orange with pale setae; scape slightly shorter than flagellum, grey pruinescent, numerous long, dark setae; pedicel much shorter than scape, grey pruinescent, short dark setae; flagellum brown pruinescent, without setae.

Thorax: scutum and scutellum grey-green pruinescent, broad, grey stripe of velutum medially, stripe yellowed posteriorly, numerous fine, dark, setae scattered over scutum; pleuron black, vertical band of bright silver velutum on each thoracic segment extending down from scutum to coxa, proepisternum, proepimeron, anepisternum, katepisternum, pteropleural callus and coxae with long white setae; legs pale yellow, femora (particularly fore femur) darkened basally; tarsi darkened distally; haltere pale yellow; wing hyaline, costal cells faint yellow infuscate, venation dark. Scutal chaetotaxy: np, 4; sa, 1; pa, 1; dc, 3; sc, 1.

Abdomen: completely black, tergites 1–6 with band of bright silver velutum on posterior margin; sternites 1–6 with silver velutum laterally; tergites 1–4 with long, fine, white setae laterally; genitalia black dorsally, brown ventrally, covered in black setae.

Genitalia (Figs 66–72): gonocoxite with secondary ventral ridge absent, outer gonocoxal process narrowed apically, reflexed inwards slightly at tip; inner gonocoxal process narrow, bent inwards, only slightly spatulate apically; gonostylus apex reflexed dorsomedially, dorsal spur well developed with numerous large setae; distiphallus relatively short and deep, apex directed ventrally at approximately 45°, without projections.

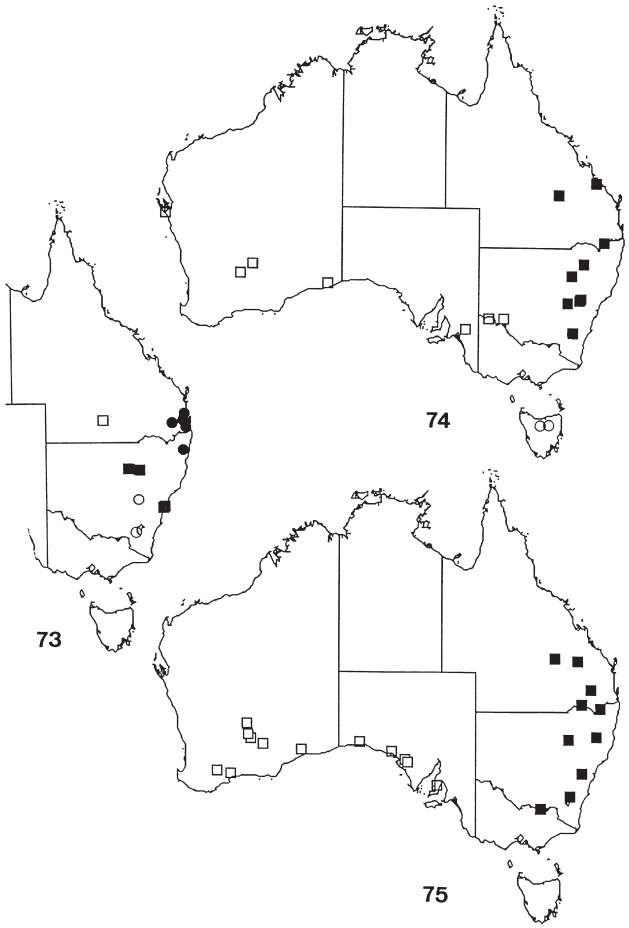
**Female.** Same as male except: frons wider than ocellar tubercle, silver-bronze velutum, small dark setae scattered dorsally over frons, dark setae around base of antennae shorter than male; abdomen with silver velutum muchless extensive; short, dark setae sparsely distributed over segments.

Genitalia: furca sclerotised into a ring; spermathecal sac trilobate (Fig. 39); spermathecae arranged basally on spermathecal sac duct.

**Comments.** *Taenogerella platina* sp. n. is easily separated from the other species of *Taenogerella* by the completely black abdomen and male genitalic characters. The trilobate spermathecal sac is autapomorphic for this species.

**Etymology.** The specific epithet is derived from the Spanish: *platina* f. – substance like silver, referring to the silver-grey scutum colour.

**Distribution.** *Taenogerella platina* sp. n. has been collected in south-eastern Queensland, eastern New South Wales and north-eastern Victoria (Fig. 75), with a similar distribution pattern to *Ta. elizabethae* sp. n.




***Figs 73–75.*** Distributions. **(73)** *Taenogera* and *Actenomeros*: *T. longa* (Schiner)(■); *T. notatithorax* Mann (●); *T. nitida* (Macquart)(□); *A. onyx* sp. n. (○). **(74)** *Taenogerella* and *Actenomeros*: *Ta. elizabethae* sp. n. (■); *Ta. nigrapicalis* (Mann)(□); *Ac. corniculaticaudus* sp. n. (○). **(75)** Distribution of *Taenogerella*: *Ta. platina* sp. n. (■); *Ta. schlingeri* sp. n. (□).

### *Taenogerella schlingeri* Winterton and Irwin, sp. n. (Figs 50–57,75)

**Types. Western Australia:** holotype male, Fitzgerald River National Park (33°47´S, 119°45´E), 5.i.1986, G. and A. Daniels, mv lamp (MEI 028106) (AM). Condition: good. Paratypes: two males, Pingrup, 21.xi.1958, E.F. Riek (MEI 028125–26) (ANIC); one male, 19 miles NNW Widgiemooltha (31°14´S, 121°28´E), 6.xi.1969, Key and Upton (MEI 028107) (ANIC); one male, 34 miles NNW Fraser Range H.S. (31°34´S, 122°35´E), 8.xi.1969, Key and Upton (MEI 028103) (WAM); one male, 11 km NE Coolgardie (30°53´S, 121°15´E), 10.x.1981, I.D. Naumann, J.C. Cardale (MEI 028104) (ANIC); one male, 25 km ESE Cocklebiddy, 25.x.1977, D.H. Colless, at light (MEI 028110) (IRWC); one male, 5 km S Goongarrie (30°05´S, 121°09´E), 15.xi.1970, Upton, Feehan (MEI 028105) (WAM).

**Other material examined. South Australia:** two males, one female, 41 km NE Nullarbor, 24.x.1977, D.H. Colless, at light (MEI 028100, 028101, 028111) (ANIC); two males, Poochera, 23.x.1977, D.H. Colless, at light (MEI 028099, 28109) (IRWC); one male, 12 km E Kyancutta (33°08´S, 135°42´E), 14.x.1981, J.C. Cardale (MEI 028096) (ANIC); two males, Minnipa, 23.x.1958, I.F.B. Common (MEI 028097–8) (ANIC); one male, 35 km E Ceduna, 28.xi.1958, E.F. Riek (MEI 028108) (ANIC); one male, Stenhouse Bay, Yorke Peninsula, 29.xi.1977, R. Laughlin, W.A.R.I., Aphid Migration Project (MEI 028102) (IRWC).

**Diagnosis.** Scutum black to grey-green with two diffuse pale stripes; scutellum with one to two pairs of bristles; four to eight pairs of dorsocentral bristles; abdomen pale yellow to orange; spermathecal sac simple; male abdominal velutum restricted to posterior margin of tergites 1–7; costal margin of wing hyaline.

**Description. Male.** Head: frons very narrow, covered with bright silver velutum, long dark setae around base of antennae; ocellar tubercle grey pruinescent, long dark setae; occiput concave, grey-silver pruinescent, single row of dark, postocular setae, scattered dark setae over occiput; gena with silver velutum and numerous long, white setae; palp brown with pale setae; scape slightly shorter than flagellum, silver velutum, numerous long, dark setae; pedicel much shorter than scape, silver pruinescent, short dark setae; flagellum grey-brown pruinescent, with several dark setae basally.

Thorax: scutum and scutellum black to grey-green pruinescent, two diffuse pale stripes along dorsocentral lines, area between stripes yellowed posteriorly, lateral margins with silver velutum, numerous fine, dark, setae scattered over scutum; pleuron and coxae integument colour black, covered with bright silver velutum, proepisternum, proepimeron, anepisternum, katepisternum, pteropleural callus and coxae with numerous, long, white setae; legs pale yellow, tarsi darkened distally; haltere pale yellow; wing hyaline, venation dark. Scutal chaetotaxy: np, 4; sa, 1; pa, 1; dc, 4–8; sc, 1–2.

Abdomen: tergite 1 dark brown rest of segments yellow, tergites 1–7 with bright silver velutum along posterior margin; segments 1–4 with numerous long, fine, white setae laterally and ventrally; genitalia orange-yellow, covered in black setae.

Genitalia (Figs 50–57): gonocoxite with secondary ventral ridge, size variable; inner gonocoxal process narrow, spatulate apically; gonostylus large, spur on dorsal ridge poorly developed, evident as a series of large setae; distiphallus relatively long, apex directed ventrally at 90°, small dorsal and ventral projections.

**Female.** Same as male except: frons wider than ocellar tubercle, silver-bronze velutum, small dark setae scattered dorsally over frons, dark setae around base of antennae shorter than male; scattered setae on scutum shorter than in male; abdomen with silver velutum only on intersegmental membranes of tergites 1–5, short, dark setae sparsely distributed over segments.

Genitalia (cf. Figure 41): furca weakly sclerotised anteriorly; spermathecal sac simple; spermathecae arranged basally on spermathecal sac duct.

**Comments.** There appear to be two phenologically different,

allopatric populations of this species. The Western Australian specimens have distinct pale longitudinal stripes on a dark scutum (similar to *Ta. nigrapicalis* Mann), while in the South Australian specimens the stripes are very faint and the scutum colouration is slightly greyed. The male genitalia of both populations are identical. Further ecological and molecular data may show these populations to be distinct species. *Taenogerella schlingeri* sp. n. is closely related to *Ta. nigrapicalis* but can be separately by abdominal velutum restricted to the posterior margin of tergites and shape of the gonostyli.

**Etymology.** The specific epithet is proposed in honour of Evert I. Schlinger.

**Distribution.** *Taenogerella schlingeri* sp. n. is distributed throughout southern South Australia and Western Australia (Fig. 75).

## ACKNOWLEDGEMENTS

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## APPENDIX 1

### Checklist genera and species of the *Taenogera* genus-group (genus names in parentheses are previous generic placements).

*Actenomeros* Winterton and Irwin, gen. n.:
- *corniculaticaudus* Winterton and Irwin, sp. n.
- *onyx* Winterton and Irwin, sp. n.

*Ectinorhynchus* Macquart 1850:
- *albimanus* Kröber 1914
- *brunneus* Kröber 1912
- *castaneus* Hutton 1901 (*Anabarhynchus*)
- *cupreus* Hutton 1901 (*Anabarhynchus*)
- *latistria* Walker 1848 (*Xylophagus*)
- *levis* Mann 1933
- *micans* Hutton 1901 (*Anabarhynchus*)
- *phyciformis* White 1915
- *pyrrhotelus* Walker 1854 (*Agapophytus*)
- *rufipes* Kröber 1912

*scutellus* Mann 1933
*terminalis* Walker 1848 (*Xylophagus*)
*variabilis* Macquart 1846 (*Thereva*)
*venusta* Erichson 1842 (*Thereva*)
*Eupsilocephala* Kröber 1912:
*kroeberi* Paramonov 1950
*singula* Walker 1848 (*Thereva*)
*Johnmannia* Irwin & Lyneborg 1989:
*tasmanica* Paramonov 1950 (*Mannia*)
*Nanexila* Winterton & Irwin 1999:
*argentiquadris* Winterton & Irwin *in* Winterton *et al*., 1999
*armeniacum* Winterton & Irwin *in* Winterton *et al*., 1999
*atricostalis* Winterton & Irwin *in* Winterton *et al*., 1999
*aureilineata* Winterton & Irwin *in* Winterton *et al*., 1999
*carminata* Winterton & Irwin *in* Winterton *et al*., 1999
*cylomelasma* Winterton & Irwin *in* Winterton *et al*., 1999
*danielsi* Winterton & Irwin *in* Winterton *et al*., 1999
*furcata* Winterton & Irwin *in* Winterton *et al*., 1999
*gracilis* Mann 1928: 167 comb. n. (*Taenogera*)
*intermedia* Winterton & Irwin *in* Winterton *et al*., 1999
*lignyos* Winterton & Irwin *in* Winterton *et al*., 1999
*ligula* Winterton & Irwin *in* Winterton *et al*., 1999
*manni* Mann 1955 (*Anabarhynchus*)
*nana* Winterton & Irwin *in* Winterton *et al*., 1999
*palassa* Winterton & Irwin *in* Winterton *et al*., 1999
*paradoxa* Winterton & Irwin *in* Winterton *et al*., 1999
*ruficornis* Macquart 1850 (*Anabarhynchus*)
*variabilis* Winterton & Irwin *in* Winterton *et al*., 1999
*vittata* Winterton & Irwin *in* Winterton *et al*., 1999
*Squamopygia* Kröber 1928:
*ornata* Kröber 1928
*Taenogera* Kröber 1912:
*longa* Schiner 1868 (*Anabarhynchus*)
*nitidus* Macquart 1850 (*Anabarhynchus*)
*notatithorax* Mann 1928
*Taenogerella* Winterton and Irwin, gen n.:
*elizabethae* Winterton and Irwin, sp. n.
*nigrapicalis* Mann 1928: 16 comb. n. (*Taenogera*)
*platina* Winterton and Irwin, sp. n.
*schlingeri* Winterton and Irwin, sp. n.